# Decision Support Tool and Simulation Testbed for Airborne Spacing and Merging in Super Dense Operations, Phase II

Completed Technology Project (2007 - 2009)

## Project Introduction

The key innovation in this effort is the development of a decision support tool for distributed air-ground scheduling sequencing, spacing and merging of aircraft in the terminal airspace, and the development of modeling and simulation testbed that will enable the evaluation of NAS wide impacts of technologies related to Airspace Super Dense Operations in the Terminal Airspace. The SBIR will primarily focus on developing algorithms and a simulation testbed that will enable the modeling and fast-time simulation of simultaneous sequencing, spacing merging and de-confliction in terminal airspace, reduced arrival spacing (with altitude offset/co-altitude) for very closely spaced parallel runways at OEP airports (Super Dense Airports Concepts), High density corridors (tubes) characterized by parallel tracks and delegation of separation responsibility to the flight deck via CDTI and ADS-B and Rerouting for mitigation of weather impacts to terminal area operations The tesbed will be built on top of NASA's Airspace Concept Evaluation System (ACES). While ACES does provide gate to gate simulation capability of the NAS, it currently does not include the modeling and simulation support for spacing and merging related concepts in the terminal airspace. This research effort is a direction in meeting this technology need.

## Primary U.S. Work Locations and Key Partners
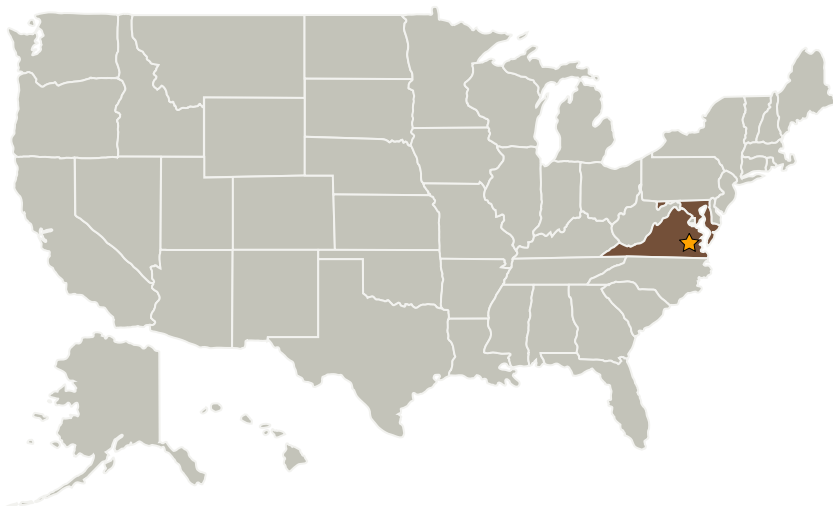




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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ⭐Langley Research Center(LaRC) | Lead Organization | NASA Center | Hampton, Virginia |
| Intelligent Automation, Inc. | Supporting Organization | Industry | Rockville, Maryland |

| Primary U.S. Work Locations | |
|---|---|
| Maryland | Virginia |

## Project Transitions

▶ **November 2007:** Project Start

✔ **November 2009:** Closed out

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  └ TX05.1 Optical Communications
    └ TX05.1.4 Pointing, Acquisition and Tracking (PAT)